

527,009

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
25 March 2004 (25.03.2004)

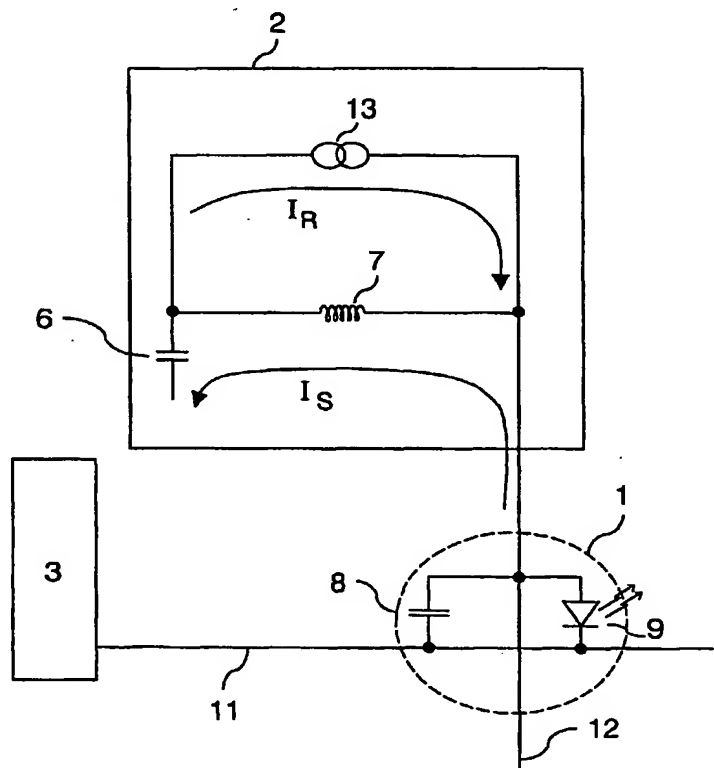
PCT

(10) International Publication Number  
**WO 2004/025609 A2**

- (51) International Patent Classification<sup>7</sup>: **G09G**
- (21) International Application Number:  
PCT/IB2003/003740
- (22) International Filing Date: 31 July 2003 (31.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
02078731.3 10 September 2002 (10.09.2002) EP
- (71) Applicant (for all designated States except US): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **VOSSEN, Francisus, J.** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). **LOS, Remco** [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: **DEGUELLE, Wilhelmus, H., G.**; Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: MATRIX DISPLAY DEVICE WITH ENERGY RECOVERY CIRCUIT



(57) Abstract: Matrix display device having row electrodes (4) and column electrodes (5), an intersection of a row and a column electrode defining a pixel cell (1) having a pixel cell capacitance (8), and drive circuits (2,3). Blind energy used for charging the pixel cell capacitances (8) when driving the pixel cells (1) is not dissipated but stored into a buffer capacitor (6) through an inductor (7) forming a series inductor-capacitor circuit and subsequently recovered by discharging the buffer capacitor (6) into the pixel cell capacitances (8) through a current source (13). Energy recovery is thus current driven, which allows to control the light reflected or emitted by the pixel cell (1) in a manner which is less dependent on temperature variations and/or ageing of the device.

WO 2004/025609 A2